Module 2: What is Agile? Why use it?

TLO: Given a DoD program involved in software development, the student will recognize situations where applying agile development methods philosophy results in a positive benefit to the speed and efficiency of a software development effort.

ELOs

1 – Recognize Agile tenets and principles

2 – Recognize the characteristics of an agile environment.

3- Recognize common misconceptions of Agile

Assessment

MT – Agile principles are the foundation of “what is Agile” more than any one method or practice (ELO 1)

LP1 – X (ELO 1)

LP2 – Y (ELO 2)

MT - Agile is not a silver bullet, but there are conditions that could make it appropriate for use in a program (ELO 3)

LP3 – Z (ELO 3)

MT – Agile is not a license to de-value traditional approaches (ELO 3)

Module Vignette

What story do we want to tell as motivation and to support terminal learning objective

Module Contents

1- Agile motivation for software / systems (ELO 1, 2)

2- Agile tenets and principles (ELO 1)

3- Agile Methods Landscape (ELO 2)

4-Common Agile processes and methods (ELO 2)

5- Agile Myth-busting (ELO 3)

Subtopic 1: Agile motivation for software / systems

- What is Agile?
  - 30,000-foot introduction to steps in waterfall software development
  - 30,000-foot introduction to Agile software development through iterations
  - Important: Just design/build/test software tasks, not DoDI 5000.02 or V model detail
- What are the major motivations to using Agile
  - Increase operational tempo to deliver more frequently to the field
  - Problem and solution space lack definition
  - Alignment of efforts across multiple programs
- Major Takeaways
  - Major Takeaway 1: Agile is not a silver bullet, but there are conditions that could make it appropriate for use in a program

Subtopic 2: Agile tenets and principles

- Agile Manifesto
  - **Individuals and interactions** over processes and tools
  - **Working software** over comprehensive documentation
  - **Customer collaboration** over contract negotiation
  - **Responding to change** over following a plan
- 12 Agile principles (probably best to insert a slide that has them on)
- Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
- Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.

Subtopic 2: Agile tenets and principles (cont.)

- Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
- Business people and developers must work together daily throughout the project.
- Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
- The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
- Working software is the primary measure of progress.
- Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
- Continuous attention to technical excellence and good design enhances agility.

Subtopic 2: Agile tenets and principles (cont.)

- Simplicity--the art of maximizing the amount of work not done--is essential.
- The best architectures, requirements, and designs emerge from self-organizing teams.
- At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.
- Major Takeaways:
  - Major Takeaway 3 – Agile Manifesto is not a license to de-value traditional approaches
  - Major Takeaway 4 – Agile principles are the foundation of “what is Agile” more than any one method or practice

Subtopic 3: The agile methods landscape

- A working definition of Agile
  - An iterative and incremental(evolutionary) approach to software development which is performed in a highly collaborative manner by self-organizing teams within an effective governance framework with “just enough” ceremony that produces high quality software in a cost effective and timely manner which meets the changing needs of its stakeholders. [Ambler 2013]
- Lean Thinking and Engineering Principles work in concert to deliver agility
  - Take an economic view
  - Apply systems thinking
  - Assume variability; preserve options
  - Build incrementally with fast, integrated learning cycles
  - Base milestones on objective evaluation of working systems
  - Visualize and limit Work in Process (WIP), reduce batch sizes, and manage queue lengths (apply concepts of product development flow)
  - Apply cadence; synchronize with cross-domain planning
  - Unlock the intrinsic motivation of knowledge workers
  - Decentralize decision-making

Subtopic 3: The agile methods landscape (2)

- Methodologies considered Agile
  - Scrum
  - XP
  - Crystal
  - TDD
  - DSDM
  - KANBAN
  - Disciplined Agile Delivery
  - Scaled Agile Framework

Subtopic 4: Common agile concepts and practices

- Agile is a team approach
- Observable characteristics of Agile Implementations
  - Incremental and iterative
  - Collaborative
  - Loosely coupled Architecture
  - Dedicated
  - Time-boxed

Subtopic: 5-Agile Myth busting

- Discuss common agile myths
  - Agile is a fad
  - Agile teams don’t document
  - Agile is “wild west” programming
  - Agile only works in co-located environments
  - Agile is just spiral renamed
  - Agile won’t work in DoD or Government environments
  - Agile only works on small projects
  - You can’t used EVM on Agile Software Developments

Module 3: Basic Agile Concepts – when and where to apply it

TLO: Given a contractor's development approach student will recognize alignment with agile principles

ELOs

1. Recognize conditions in the DoD environment that make it appropriate (or inappropriate) to consider Agile
2. Recognize what a program office would see in an Agile program vs a traditional one

Assessment

MT – Although not explicitly called out yet in DoD acquisition policy, there are many more enablers to using Agile in DoD today than there were 5 years ago (ELO 1)

LP – Contractors are regularly proposing Agile as a solution approach regardless of government systems engineering methodology (ELO 1)

MT – Agile projects increase visibility of actual project completion instead of waiting for a missed transition or software lifecycle event (ELO 2)

Module Story

What story do we want to tell as motivation and to support terminal learning objective

Module Contents

1-Recent regulations related to Agile (ELO 1)

2-Defense contracting trends in the use of Agile (ELO 1)

3-Agile as a risk mitigation strategy (ELO 2)

4-Differences between traditional and Agile development (ELO 2)

Subtopic 1: Recent regulations related to Agile

- US Digital Services Agency – Digital Playbook
- GSA – 18F Digital Services
- DoDI 5000.02 acquisition lifecycle models
- CJSCI 3170.01I JCIDS manual / IT Box
- Better Buying Power 3.0 tenets
- Major Takeaway:
  - Major Takeaway 6 – Although not explicitly called out yet in DoD acquisition policy, there are many more enablers to using Agile in DoD today than there were 5 years ago

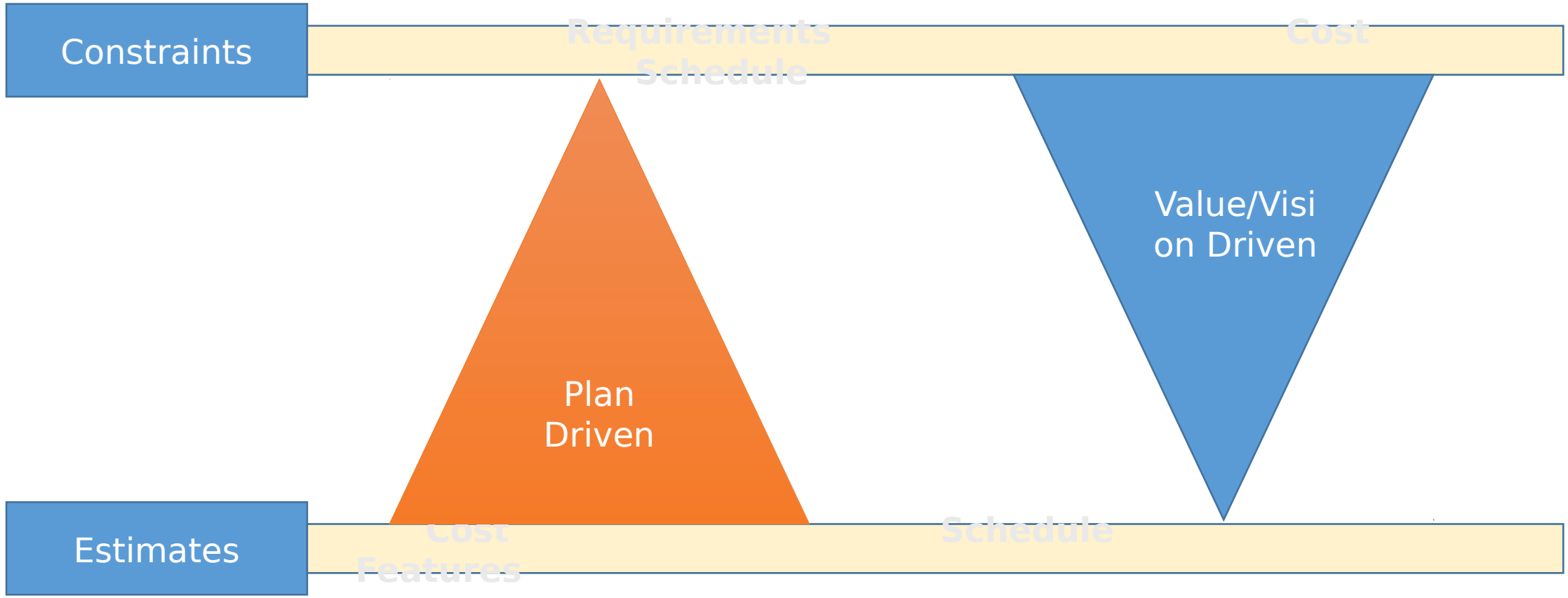
Subtopic 2: Defense contracting trends in the use of Agile

- System integrators supporting DoD:
  - Agile is often used within the context of a traditional systems engineering / acquisition lifecycle, especially when introduced mid-contract
  - Sometime use of Agile principles begins in a covert way due to perception of organizational resistance
  - Agile projects and teams use metrics to manage efficient delivery
    - Strong ties between health of metrics and definition of done
    - Metrics support system integrator ability to produce Earned Value Management data
  - Industry partners are using established frameworks that scale Agile tenets to larger projects typical in Defense
  - Major Takeaway:
    - Major Takeaway 7 – Contractors are regularly proposing Agile as a solution approach regardless of government systems engineering methodology

Subtopic 3: Differences between traditional development and Agile development

- Both Waterfall and Agile Development Methods have Risks
- The Traditional approach is hardware centric
  - Classic Engineering V (Assuming a Hardware-centric system)
  - Difference between Model 1 and Model 2 of DOD5000
- Waterfall and Agile both use the same development basic building blocks – Analyze, design, build, test, and deploy.
  - Step through how waterfall and agile processes these differently – waterfall, incremental, agile
- Describe the Agile Approach
  - Scrum Example (Key elements, framework, terms, artifacts, ceremonies)

Comparison between Waterfall and Agile Process



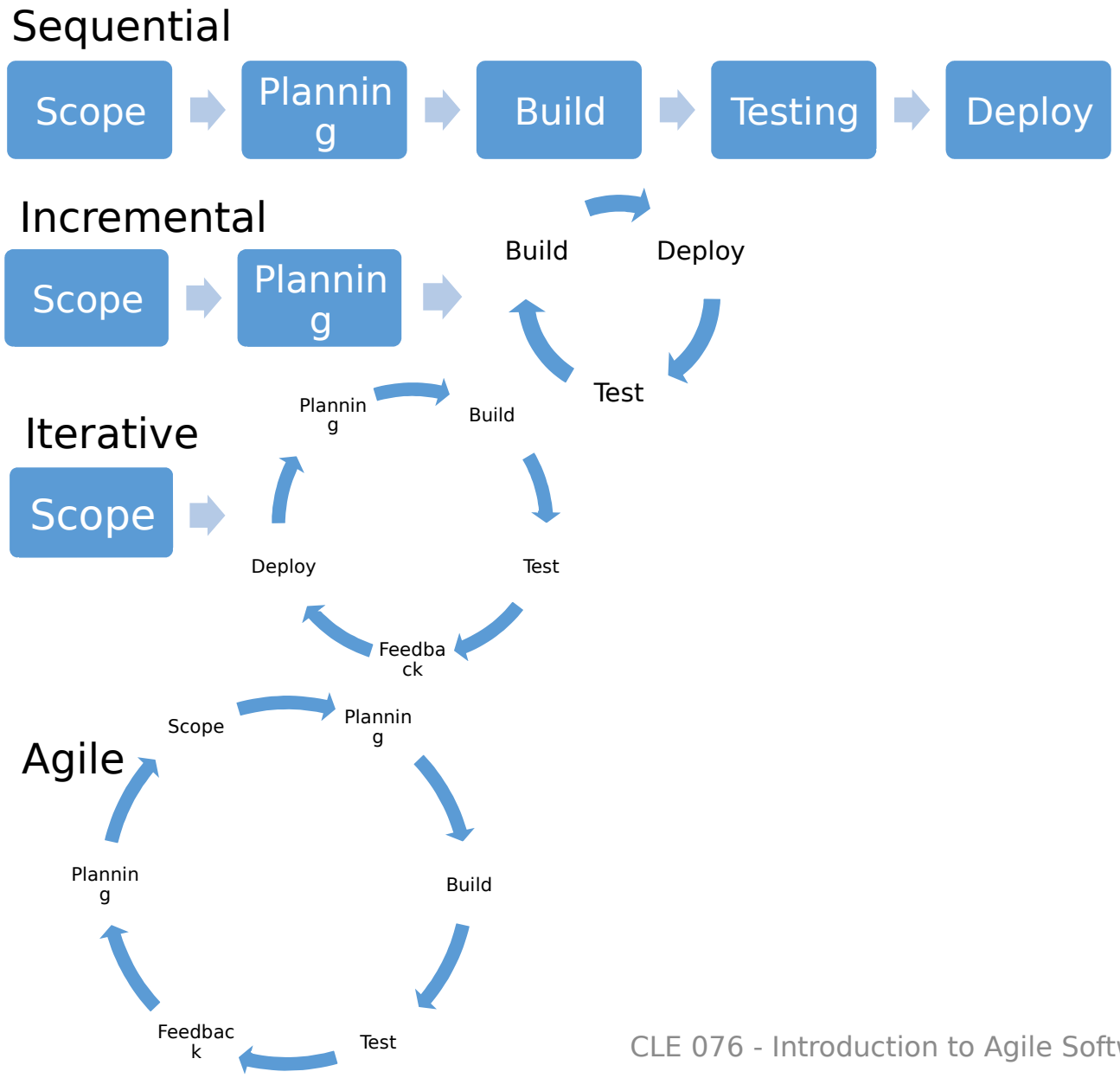
Subtopic 3: Differences between traditional development and Agile development

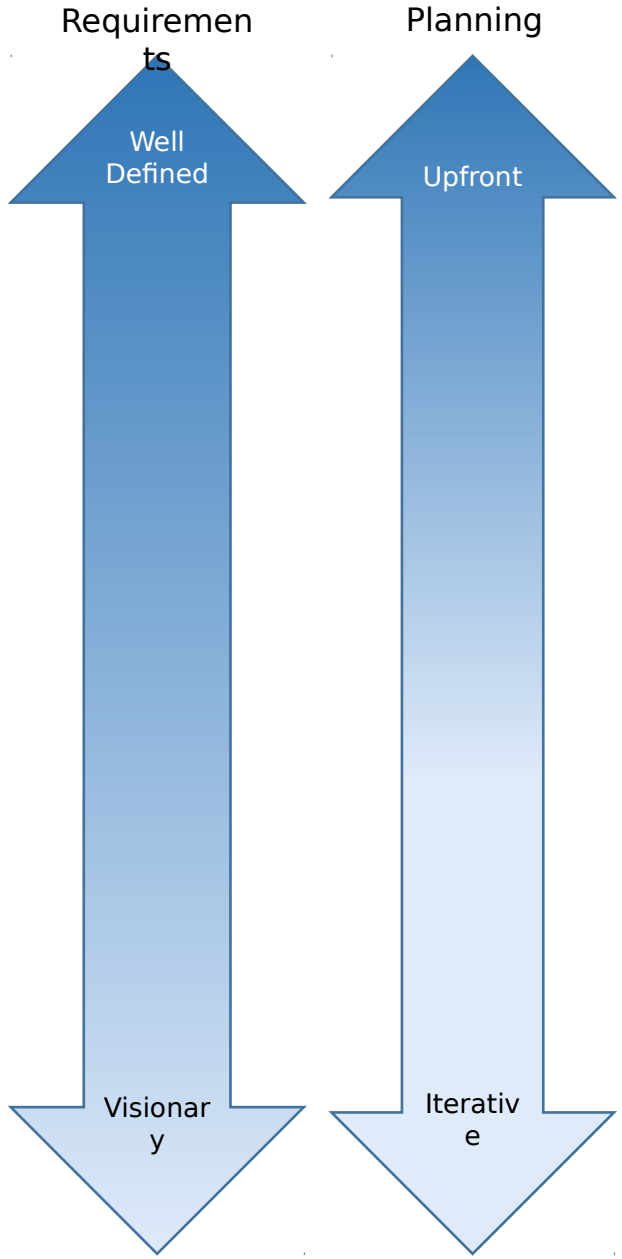
- There are times when Agile does not apply
  - Traditional approach situations
  - Agile approach works well situations
  - Show where the best of Agile counters the worst of traditional
- When should it not be considered?
  - Sufficient user/stakeholder involvement is key (move to module 3)

Subtopic 4: Agile as a risk mitigation strategy

- The Agile methodology approach recognizes that requirements WILL change and plans in advance for it
- Operational tempo that delivers software raises visibility of project issues and risks
- Key to risk mitigation is establishing and enforcing the definition of done
- Major Takeaway:
  - Major Takeaway 5 – Agile projects increase visibility of actual project completion instead of waiting for a missed transition or software lifecycle event.

Agile/Hybrid/Waterfall Overview





Module 4: Effect of Agile on the DoD Program Office

TLO: Given a DoD program involved in software development using Agile philosophy methodologies, the student will understand differences in roles that a Program Office may need to assume to enable program success

ELOs

1. Identify key characteristics of a PMO's staffing requirements within an Agile environment
2. Recognize the frequency of communication between PMO and stakeholders
3. Identify how the technical review process in an Agile environment impacts the ability of a PMO to mitigate program risk

Assessment

Module Story

What story do we want to tell as motivation and to support terminal learning objective

Personnel impact to a current organization

Module Contents

1- PMO Staffing & Roles (ELO 1)

2- Stakeholders (ELO 2)

3- Technical Reviews (ELO 3)

Subtopic 1: PMO Staffing & Roles

- What is the overall impact to the PMO organization in an Agile environment?
  - Need a list of impacts here…
- Impact to Program Office roles
  - Program Manager / Deputy Program Manager (cross-check other module)
    - Ensure sufficient stakeholder buy-in and participation in all efforts
    - Prepare government team for battle rhythm and frequency of interaction
    - Prioritization of requirements
  - Budget & Financial Management / Contracts Lead
    - Expectations for deliverables and contract scope management
  - Systems Engineering & Test Leads (cross-check other module)
    - Frequency of interaction and increasing level of detail
    - Fluidity of requirements at the detail level

Subtopic 2: PMO Engagement With Stakeholders

- Stakeholder importance in an Agile environment
  - Overall importance of stakeholder commitment and availability
  - Importance of highly involved, empowered user representative to make decisions at the project level on a daily/weekly basis
- Who are the key stakeholders?
  - List of stakeholders here – with discussion of roles and alignment (note – not PMO roles specifically but general stakeholders)
    - Stakeholder alignment with reasons for Agile approach
    - E.g. User – describe and prioritize requirements (including user stories), test & acceptance (participate in incremental planning and reviews)
- Prioritization of user requirements
- Assignment of user requirements to releases and iterations
- User involvement in acceptance of implemented requirements
- (MITRE guide) reference

Subtopic 3: Program & Technical Reviews

- Program & technical reviews in context
  - What are the Agile reviews?
  - PMO role for managing baselines
  - Role within Agile for monitoring program progress and health of processes
- Frequency of reviews and interaction
  - No single major review at a specific level of detail (such as detailed design)
  - High frequency of smaller reviews at detail level for that iteration
- Level of detail under review
  - Minimum level of detail on entire system needed to support current iteration
  - Full detail on current iteration to support

Module 5: Effect of Agile on Engineering & Test Staff

TLO: Given a DoD program involved in software development using Agile IPM methodologies, the student will understand differences in engineering and test roles to enable program success.

ELOs

1. Identify how program technical requirements are managed in Agile contracting settings
2. Identify how program baselines are managed in an Agile environment
3. Recognize key factors for developmental testing success in an Agile environment
4. Identify different ways that System Engineering Technical processes interact with Agile Software approaches

Assessment

LP - In Agile settings, low level requirements add who and why to the typical what of requirements, often using a format called a “story” (ELO 1)

LP - Requirements in an Agile contracting setting need to be prioritized in terms of the rank order of their value to the end user and other stakeholders (ELO 1)

MT - A requirements baseline that is at too low a level of abstraction is unproductive for an Agile contract setting (ELO 1)

MT - A capability-based Work Breakdown Structure makes developing and refining requirements in an Agile setting easier than using the more hardware-focused, but typical, component-based WBS (ELO 1)

MT - automated testing is a necessity, not an option, for any decent-sized Agile program (ELO 3)

Module Story

What story do we want to tell as motivation and to support terminal learning objective

Module Contents

1 - Systems Engineering – Requirements (ELO 1~~, 2~~)

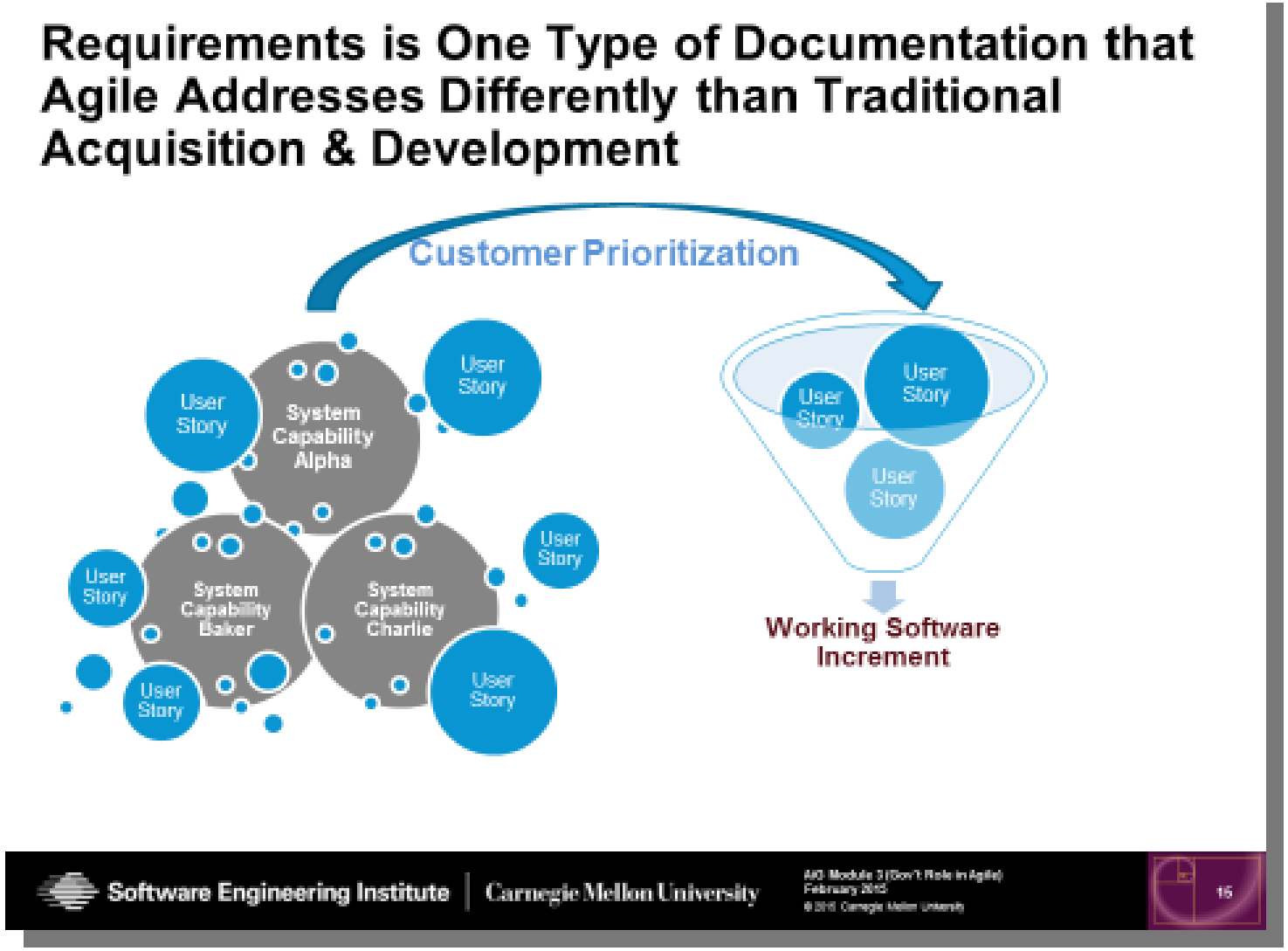
2 - Systems Engineering – Technical Processes (ELO 2)

3 - Integration and Testing (ELO 3)

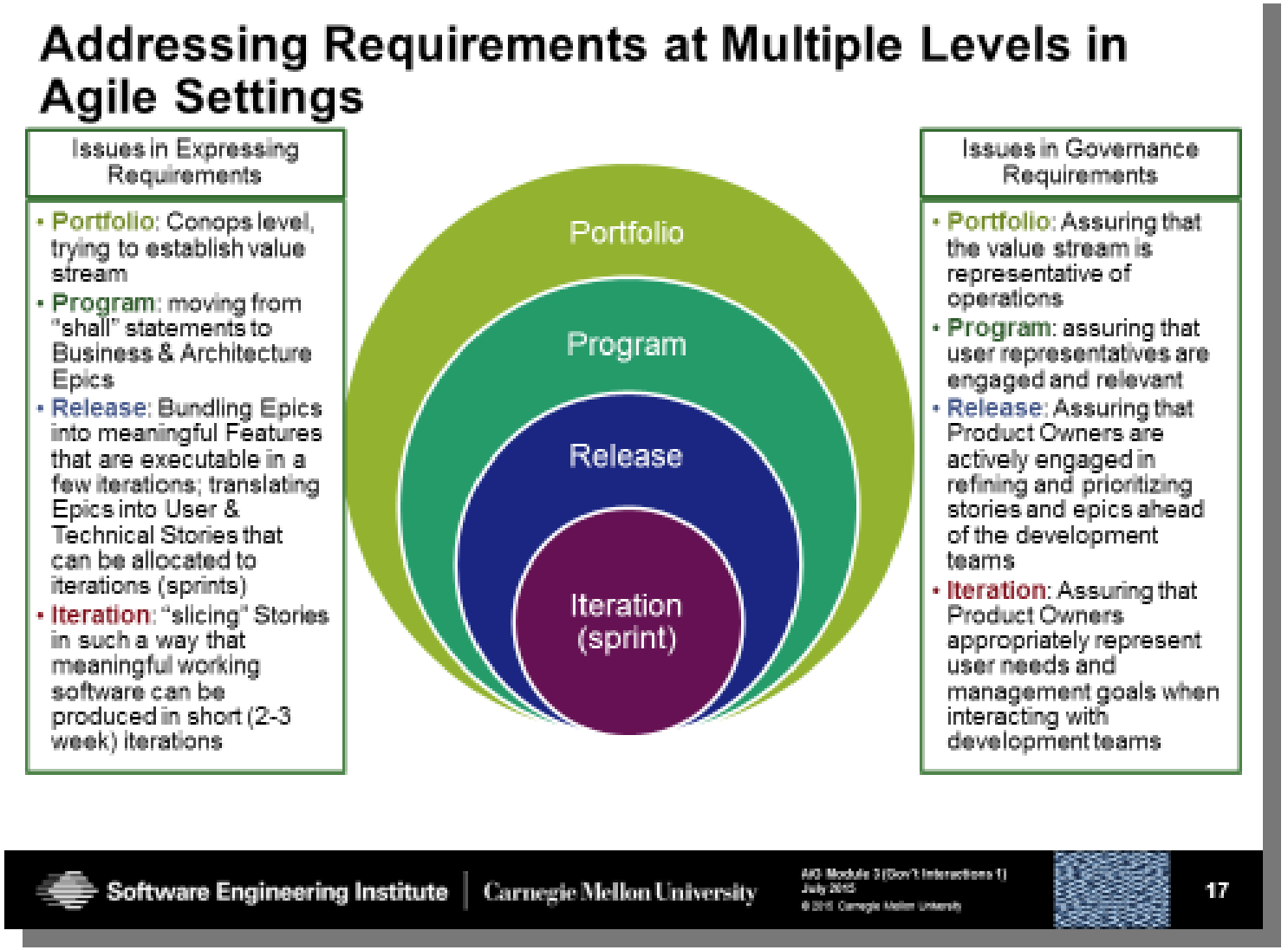
Subtopic 1: Systems Engineering - Requirements

- Requirements and Configuration Management
  - Flow of expressing requirements (somewhat of a review from Module 4)
    - Using a user story to flesh out details of requirements
    - Horizontal and vertical traceability
  - Flow and configuration management of requirements, prioritization and releases
- Major Takeaways
  - A requirements baseline that is at too low a level of abstraction is unproductive for an Agile contract setting.
  - In Agile settings, low level requirements add who and why to the typical what of requirements, often using a format called a “story”
  - A capability-based Work Breakdown Structure makes developing and refining requirements in an Agile setting easier than using the more hardware-focused, but typical, component-based WBS
  - Requirements in an Agile contracting setting need to be prioritized in terms of the rank order of their value to the end use and other stakeholders.

Suggested Content



Suggested Content

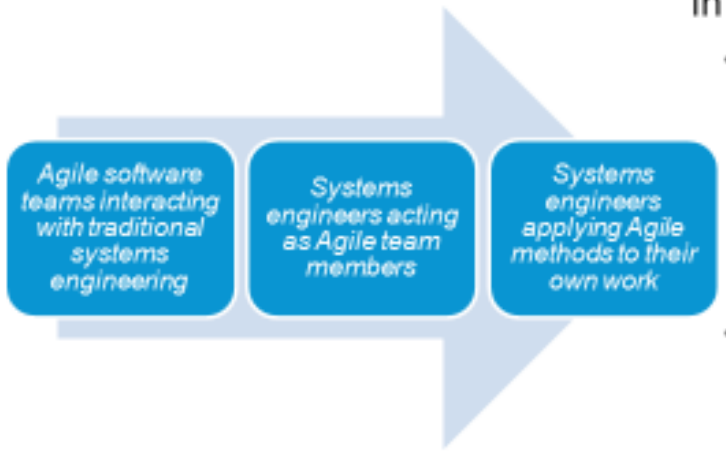

Addressing Requirements at Multiple Levels in Agile Settings
Issues in Expressing Requirements
• Portfolio: Conops level, trying to establish value stream
• Program: moving from "shall" statements to Business & Architecture Epics
• Release: Bundling Epics into meaningful Features that are executable in a few iterations; translating Epics into User & Technical Stories that can be allocated to iterations (sprints)
• Iteration: "slicing" Stories in such a way that meaningful working software can be produced in short (2-3 week) iterations
Portfolio
Program
Release
Iteration (sprint)
Issues in Governance Requirements
• Portfolio: Assuring that the value stream is representative of operations
• Program: assuring that user representatives are engaged and relevant
• Release: Assuring that Product Owners are actively engaged in refining and prioritizing stories and epics ahead of the development teams
• Iteration: Assuring that Product Owners appropriately represent user needs and management goals when interacting with development teams
Software Engineering Institute | Carnegie Mellon University
17

Subtopic 2: Systems Engineering – Technical Processes

- Approaches to managing interaction with Agile Software teams
  - Systems Engineers Acting as Agile Product Owner
  - Systems Engineers Acting as Agile Systems Architect
  - Systems Engineers Applying Agile Methods to Their Own Work
- Program baselines in an Agile setting (needs major work)
  - Technical reviews that establish and evolve program baselines
  - Functional, Allocated, Product
- Resource: Lean Engineering reference

Suggested Content

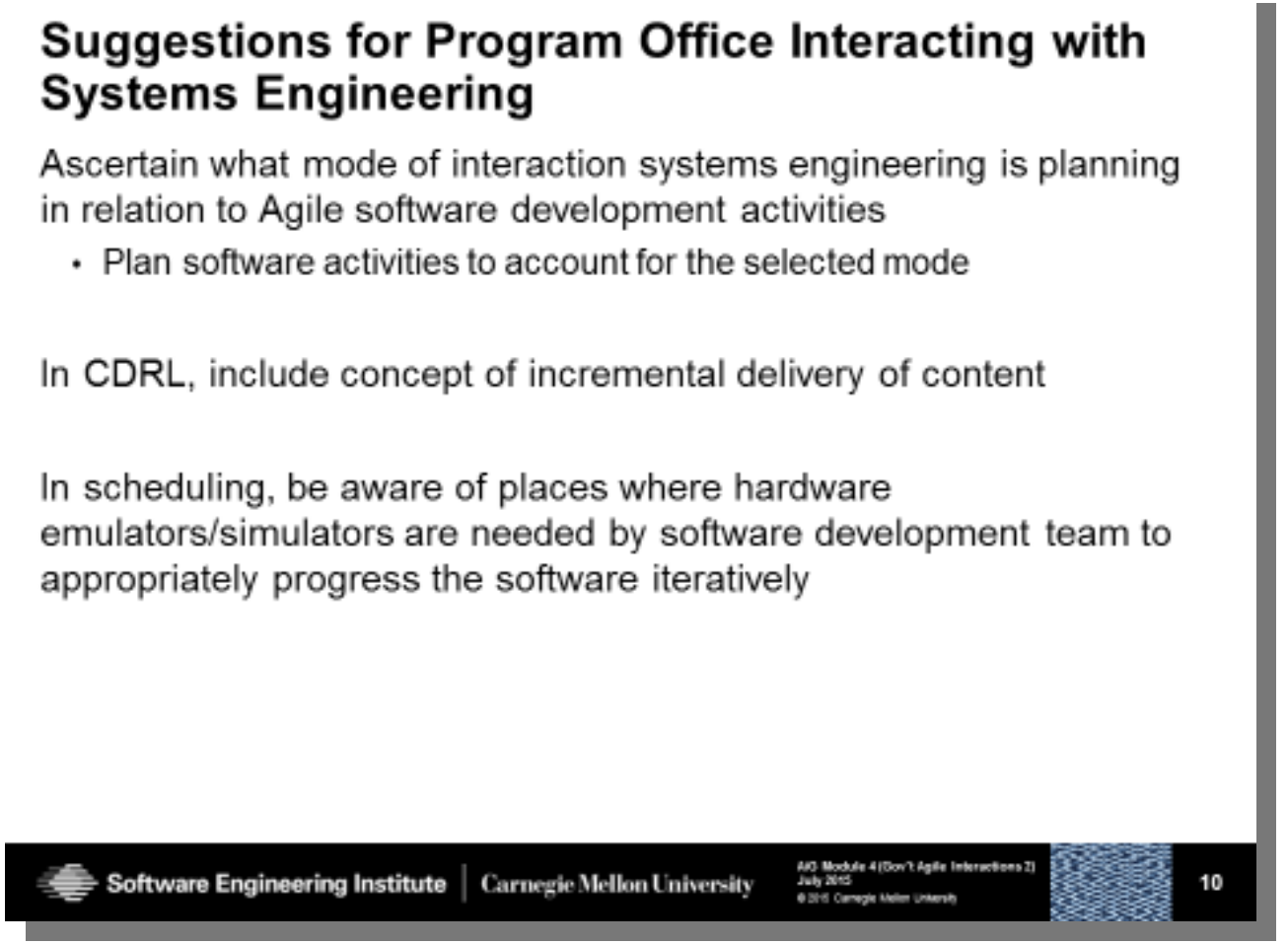
Three Approaches SEI Observed of Systems Engineering Interacting with or Being Part of Agile Teams


Agile software teams interacting with traditional systems engineering
Systems engineers acting as Agile team members
Systems engineers applying Agile methods to their own work

In reality it is a continuum:

- As software teams demonstrated/continued to demonstrate success, systems engineering teams and leaders got engaged with software processes
- Successful activities led, in at least one case, to application of Agile methods to part of systems engineering process

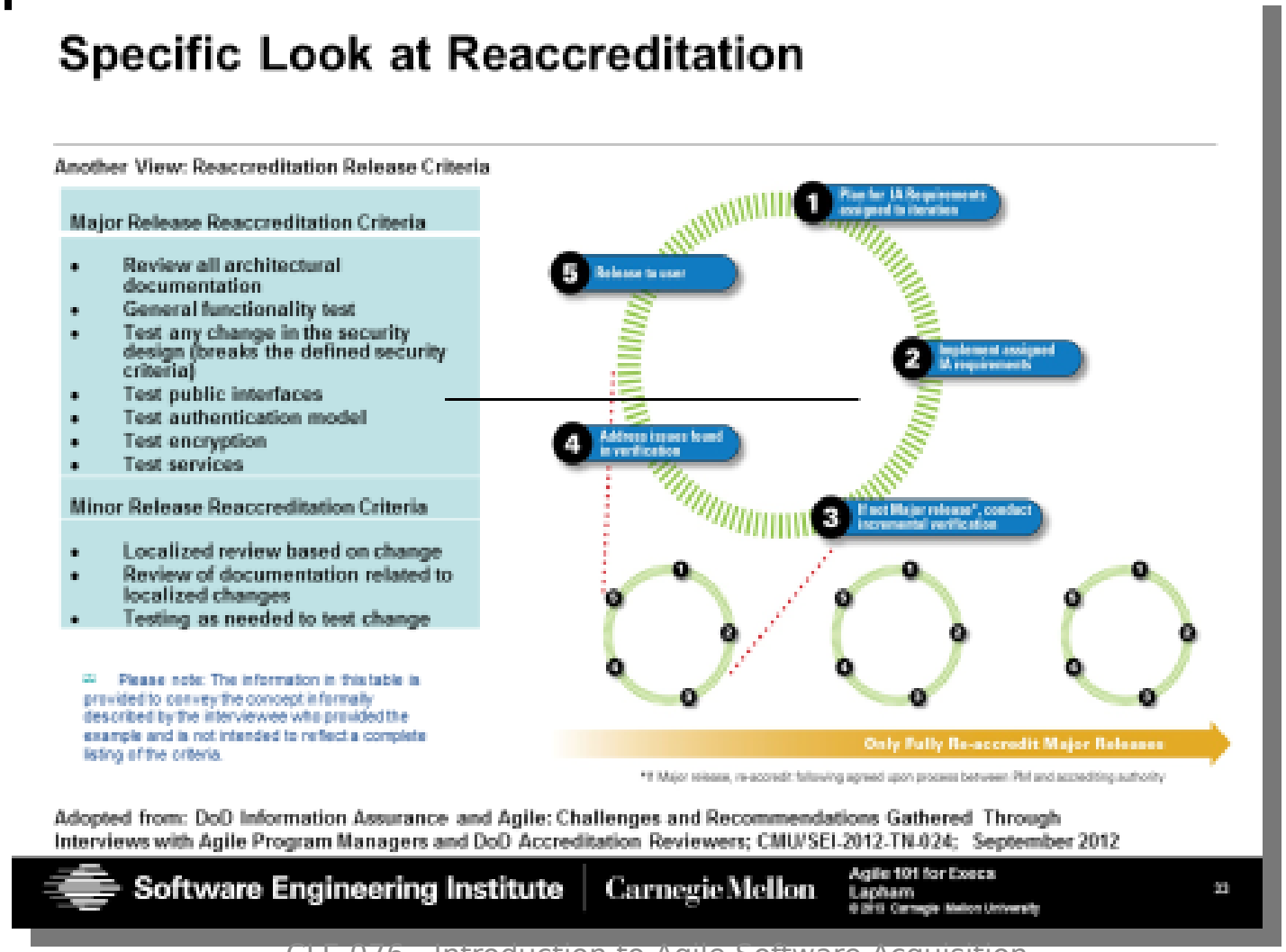
Suggested Content


Suggestions for Program Office Interacting with Systems Engineering
Ascertain what mode of interaction systems engineering is planning in relation to Agile software development activities
• Plan software activities to account for the selected mode
In CDRL, include concept of incremental delivery of content
In scheduling, be aware of places where hardware emulators/simulators are needed by software development team to appropriately progress the software iteratively
Software Engineering Institute | Carnegie Mellon University
10

Subtopic 3: Integration and Testing

- Use of supplemental test strategy to compliment the high level program TEMP
  - Deal with Measures of Effectiveness for traceability
  - Integration approaches for DT/OT activities
- Developmental testing and evaluation in an iterative approach
  - Cybersecurity staff involvement
  - Ensuring integrity of the definition of done – including cyber
  - Leverage multiple sources of evidence (unit testing, demos, traditional system testing)
- Automated testing and automation support
- Major Takeaways
  - automated testing is a necessity, not an option, for any decent-sized Agile program

Suggested Content—Need for Reaccreditation


Specific Look at Reaccreditation
Another View: Reaccreditation Release Criteria
Major Release Reaccreditation Criteria
Review all architectural documentation
General functionality test
Test any change in the security design (breaks the defined security criteria)
Test public interfaces
Test authentication model
Test encryption
Test services
Minor Release Reaccreditation Criteria
Localized review based on change
Review of documentation related to localized changes
Testing as needed to test change
Please note: The information in this table is provided to convey the concept informally described by the interviewee who provided the example and is not intended to reflect a complete listing of the criteria.
1
2
3
4
5
Only Fully Re-accredit Major Releases
Adopted from: DoD Information Assurance and Agile: Challenges and Recommendations Gathered Through Interviews with Agile Program Managers and DoD Accreditation Reviewers; CMU/SEI-2012-TN-024; September 2012
Software Engineering Institute
Carnegie Mellon
Agile 101 for Essca
Lapham

Suggested Content—Cybersecurity recommendations

Certification and Accreditation Recommendations
Define criteria for reaccreditation early in the project.
Leverage long accreditation approval wait time with frequent community previews.
Ensure requirements are prioritized according to value and risk.
Make sure Agile project teams understand the intent behind security requirements.
Ensure Agile development processes produce "just enough" security architecture.
Make sure there is at least one person with strong security analysis expertise on the team.
Foster Agile project team and accrediting authority collaboration.
Don't apply all the information assurance controls blindly.
Use COEs, SDKs and enterprise services to reduce accreditation time.
Apply a risk-based, incremental approach to security feature design and development.
Leverage architecture tactics such as layering and encapsulation to minimize impact of change.
Leverage unclassified environments for development and community previews.
Encourage the Agile teams to merge Agile and security best practices.
Software Engineering Institute
Carnegie Mellon
Agile 101 for Execs
Lapham
© 2013 Carnegie Mellon University
34

Module 6: Effects of Agile on Pre-Contract Award

TLO: Given a DoD program involved in software development, the student will identify key pre-contract award activities needed to be effective in an Agile environment

ELOs

1. Identify pre-award characteristics of an acquisition strategy that allows for Agile solicitations
2. Recognize technical aspects that contribute to the evaluation of bidders on an Agile RFP
3. Identify the benefits and risks associated with various contract type(s) in an Agile environment

Assessment

MT - Make acquisition strategy language to allow for agile (ELO 1)

MT - Determining the contract type should be based on the understanding of system context, not the use of Agile approaches (ELO 1)

LP – Evaluate that the contractor has a logical approach for execution that accommodates Agile (ELO 2)

LP - Both sides need to understand Agile risks and associated mitigations (ELO 3)

MT - The Contract is only as good as the contracting relationship, leadership must foster environment for good and effective contract management in Agile environment (ELO 3)

MT - The contract type is not as important as incremental delivery and incremental review (ELO 3)

Module Story

What story do we want to tell as motivation and to support terminal learning objective

Module Contents

1-Acquisition Strategy to accommodate Agile philosophy (ELO 1)

2-Writing RFP’s allowing for Agile Methodology (ELOs 1,2)

3-Contracting approaches for an Agile environment (ELO 3)

4-Evaluating Bidders in Agile Contracting Environment (ELO 2)

Subtopic 1: Acquisition Strategy to accommodate Agile philosophy

- Types of Acq. Strategies
  - Software Development as a Service (SDAAS)
  - Product focus
- Level of involvement of the Govt
  - Program Office to lead technical effort
  - Government developer
- Applying flexibility within the acquisition life cycle to accommodate agile approaches when applicable.
- Index of Major Takeaways
  - Make acquisition strategy language to allow for agile.

Need to be reworked: Decide how to deal with acquisition plans

Subtopic 2: Writing RFP's allowing for Agile Methodology

- Allowing for incremental technical review
- Level of detail of work effort – too detailed doesn't work
- Frequency and detail of CDRLs - too detailed doesn't work (should reflect agile principles)
- Flexible prioritization of release contents
- Allowing for incremental delivery
- Index of Major Takeaways
  - The Contract is only as good as the contracting relationship, leadership must foster environment for good and effective contract management in Agile environment.

Subtopic 3: Contracting approaches for an Agile environment

- Cost Reimbursable
  - Incentive structure reflects desired performance (benefit or risk depending on application)
  - What's challenging?
- Fixed Price
  - Best effort (benefit or risk depending on application)
  - What's challenging?
- IDIQ/BPA (task order) type of contracts
- Index of Major Takeaways
  - The contract "type" is not as important as incremental delivery and incremental review
  - Determining the contract type should be based on the understanding of system context, not the use of Agile approaches

Subtopic 4: Evaluating Bidders in Agile Contracting Environment

- How well proposal illustrates the chosen/proposed Agile approach
  - Addressing Agile Myths from Module 3
  - Understanding risk identification and mitigation
  - Evaluating past performance
  - Both sides understand their roles
  - Intended cadence of interaction
- Index of Major Takeaways
  - Evaluate the contractor has a logical approach for execution that accommodates Agile.
  - Both sides need to understand Agile risks and associated mitigations.

Module 7: Effect of Agile on Post-Contract Award

TLO: Given a DoD program involved in software development using Agile philosophy, the student will identify key post-contract award activities program analysis and oversight in an Agile environment

ELOs

1. Recognize the change in documentation delivery in an Agile environment.
2. Identify changes to the role of government agencies/oversight in programs using Agile.
3. Recognize the level of involvement required of stakeholders for Agile to be effective.
4. Recognize the applicability of EVM in an Agile environment.
5. Identify how progress is measured in an Agile environment.

Assessment

LP - Be careful what you ask for when receiving and reviewing CDRLs as multiple Levels of abstraction will exist in same package (ELO 1)

MT - Government oversight may require tailoring for an Agile environment (ELO 2)

LP - Stakeholder involvement increases in an Agile environment due to the rapid cycle of incremental planning, development, and review (ELO 3)

MT - Government’s role in product management (and incremental acceptance of the product) is critical to success (ELO 3)

LP - Agile enables situational awareness across stakeholders and provide the ability to accurately measure and forecast performance (ELO 4,5)

MT - Stakeholders should be aware of the impacts of technical debt and the migration of work in an Agile environment (ELO 4,5)

MT - Objective technical completion criteria are essential for evaluating progress and performance regardless of the level at which the measurement occurs (ELO 5)

Module Story

What story do we want to tell as motivation and to support terminal learning objective

Module Contents

1. Documentation (ELO 1)
2. Regulatory oversight (ELO 2)
3. IBR (ELO 2)
4. Participating in Agile reviews (ELO 3) note – add something about people who cross multiple projects agile/not
5. Performance Measurement (ELO 4, 5)

Subtopic 1: Documentation

- Understanding the cadence of documentation development may increase in an Agile program
  - Incremental delivery of documentation
    - Just enough for a particular iteration
  - Delivered documentation will focus on how the system was actually built
- Example (MITRE guide), Navy guide??
- Index of Major Takeaways
  - CDRLs – be careful what you ask for when receiving and reviewing. Mult. Levels of abstraction will exist in same package

Subtopic 2: Regulatory oversight

- Understanding the role of government agencies/oversight in Agile programs.
  - Direction of DCMA, PARCA, AT&L, services etc., Test, Business Systems
  - Service Acquisition Executives
- All these organizations have efforts focused on agile
  - Describe various efforts
  - Links to efforts
- Mindful tailoring (Kendall presentation, 2015 DOD 5000)?
- Index of Major Takeaways
  - Government oversight may require tailoring for an Agile environment.

Subtopic 3: IBR (Integrated Baseline Review)

- A capability-based WBS is frequently used (example-SuZ)
- The stakeholders for Agile go way beyond the immediate pgrm
  - Cyber, EVM, Finance, OT, deployment, etc
- Be aware of best practices in execution of control accounts
  - Too much detail can burden the program

- Index of Major Takeaways
  1. Government oversight requires modification in an Agile environment.

Subtopic 4: Participating in Agile reviews

- Understanding the level of involvement required for Agile processes to be effective.
  - Portfolio Management/Road-mapping
  - Incremental planning
  - Incremental reviews
- Dealing with a mix of traditional and Agile programs
  - Recognize pressure on stakeholders crossing over between traditional and Agile programs
- Index of Major Takeaways
  - Stakeholder involvement increases in an Agile IPM environment due to the rapid cycle of incremental planning, development, and review.
  - Government's role in product management (and incremental acceptance of the product) is critical to success

Subtopic 5: Progress Measurement

- Understanding the tools used to provide program insight in an Agile program.
  - Team Level Measure
    - Team productivity should not be used against the team
    - Do not compare one team against another
    - Identify various measures and how they are used
      - Velocity
      - others
  - Program Level Measure
    - EV Analyst (Agile platinum card) (contractor EVM tool)
    - Cumulative flow diagram (lean engineering world) – lifecycle, time, bottlenecks, state transitions
    - % of user story point completion (aggregate across teams)
- Measuring work migration from one increment to another
- Understanding Technical Debt
  - Summarize
    - Intentional (strategic & tactical), Unintentional
  - Managing technical debt
    - The good and the bad
    - Effects on Velocity
- Index of Major Takeaways
  - Agile enables situational awareness across stakeholders and provide the ability to accurately measure and forecast performance.
  - Objective technical completion criteria are essential for evaluating progress and performance regardless of the level at which the measurement occurs.
  - Stakeholders should be aware of the impacts of technical debt and the migration of work in an Agile environment.

Module 8: Enabling an Agile Acquisition Culture

TLO: Given a decision to include Agile offerors in an acquisition, the student will recognize cultural enablers and inhibitors to Agile embedded in the RFP and responses.

ELOs

1. Discuss why Agile is considered a significant cultural change for DoD contracted programs.
2. Identify factors in typical acquisition organizational climate that enable or provide barriers to Agile practices adoption.
3. Identify Project, team, and customer environment factors that enable or provide barriers to Agile practices adoption.
4. Identify system, technology, and process support environment factors that enable or provide barriers to Agile practices adoption.
5. Provide an overview of the RFA process for understanding Agile adoption risks and enablers.

Assessment

- LP - In most cases, Agile adoption is a CULTURE change for government organizations, so strategy, structure, skills, and procedures will all have to be addressed (ELO 1)
- LP - Understanding the adoption category, especially of early pilots, helps you determine what support mechanisms are needed to promote a successful outcome (ELO 1)
- LP - Individuals, groups, and organizations all go through a predictable cycle of dealing with change, whether the change is perceived positively or negatively (ELO 1)
- MT - Understanding where you (and groups you interact with) are in the cycle is a key to helping people through to a New Status Quo (ELO 1)
- LP - Communication mechanisms (like training, case studies) support Contact, Awareness, & Understanding (ELO 1)
- LP - Implementation mechanisms (like checklists, measures) support Trial Use, Adoption, and eventually, Institutionalization (ELO 1)
- MT - Agile adoption just at “grass roots” level won’t change culture. A “leadership only” change won’t work either. Both channels have to be engaged, and using multiple sources for “why we should do this” (ELO 1)

Assessment

- LP - There are some specific acquisition factors for Agile (e.g. enabling interim, incremental delivery) that go beyond typical technology adoption factors (ELO 2)
- LP - “Alignment” is a key term for Organizational Climate and other categories of adoption enablers (ELO 2)
- alignment between the implementation and oversight,
- alignment between the Agile tenets and principles and those of the organization
- Alignment between the leadership and the managers and practitioners
- MT - Without the leadership vision, confusion about the adoption is apparent within the organization (ELO 2)
- MT - Although much Agile adoption focuses at the team level, the project and customer climate have significant effect on the program’s ability to execute an Agile development successfully, although some of the factors (e.g. appropriately trained staff) are factors in ANY successful program (ELO 3)
- LP - Although most of the Agile adoption enablers are focused on people issues, there are some aspects of the system being developed or evolved that have an effect as well (ELO 4)
- MT - Although “individuals and interactions over processes and tools” is an Agile Manifesto tenet, it’s also true that the most successful organizations adoption Agile have made appropriate investments in choosing the right Agile practices and supporting tools for their environments (ELO 4)

Module Vignette

An Air Force organization responsible for managing the training certifications of pilots for different aircraft contracts for that software with companies that use Agile methods.

The government program office had never managed Agile contractors before. They recognized that this was a culture change for them, and hired a coach experienced in using Agile in government settings.

She surveyed the Program Office staff to determine the types of adopters who would be managing the contractor, and determined most were Early Majority (Pragmatic) with a few Early Adopters (including the Program Manager).

Those two populations need different kinds of communication (especially) and implementation support mechanisms. She constructed a program of Awareness briefings and lunch and learn sessions to move the government staff forward in the adoption, and then held a “Transforming Idea” workshop to help them translate what they had learned about Agile concepts into implementation support mechanisms (checklists, briefing templates, calendars of events, etc) that they would use in managing the contractor.

They also reviewed the different communication channels these mechanisms would use and adjusted the list to be developed to ensure that all channels were in use. The final step of the workshop was to review the “What’s Missing” picture to make sure that all elements (vision, skill, action plans, etc) had been addressed.

They then kicked off their first pilot project, a technical feasibility pilot – this pilot was populated with mostly early adopters, who identified, over the course of the first release, support mechanisms that were missing or needed improvement.

Their second pilot was an adoption feasibility pilot. It was populated primarily by Early Majority Pragmatists. They used the support mechanisms that had been developed and provided further feedback on what was needed to make Agile workable for them in their program management/engineering roles.

Module Contents

8.1 General & Agile-Specific Factors in Enabling Cultural Change (ELO 1)

8.2 Organizational Climate (ELO 2)

8.3 Project, Team & Customer Environment (ELO 3)

8.4 System Environment (ELO 4)

8.5 Technology & Process Support Environment (ELO 5)

8.6 Understanding Your Organization/Program Adoption Risks for Agile Adoption (ELO 2,3,4,5)

NOTE TO REVIEWERS

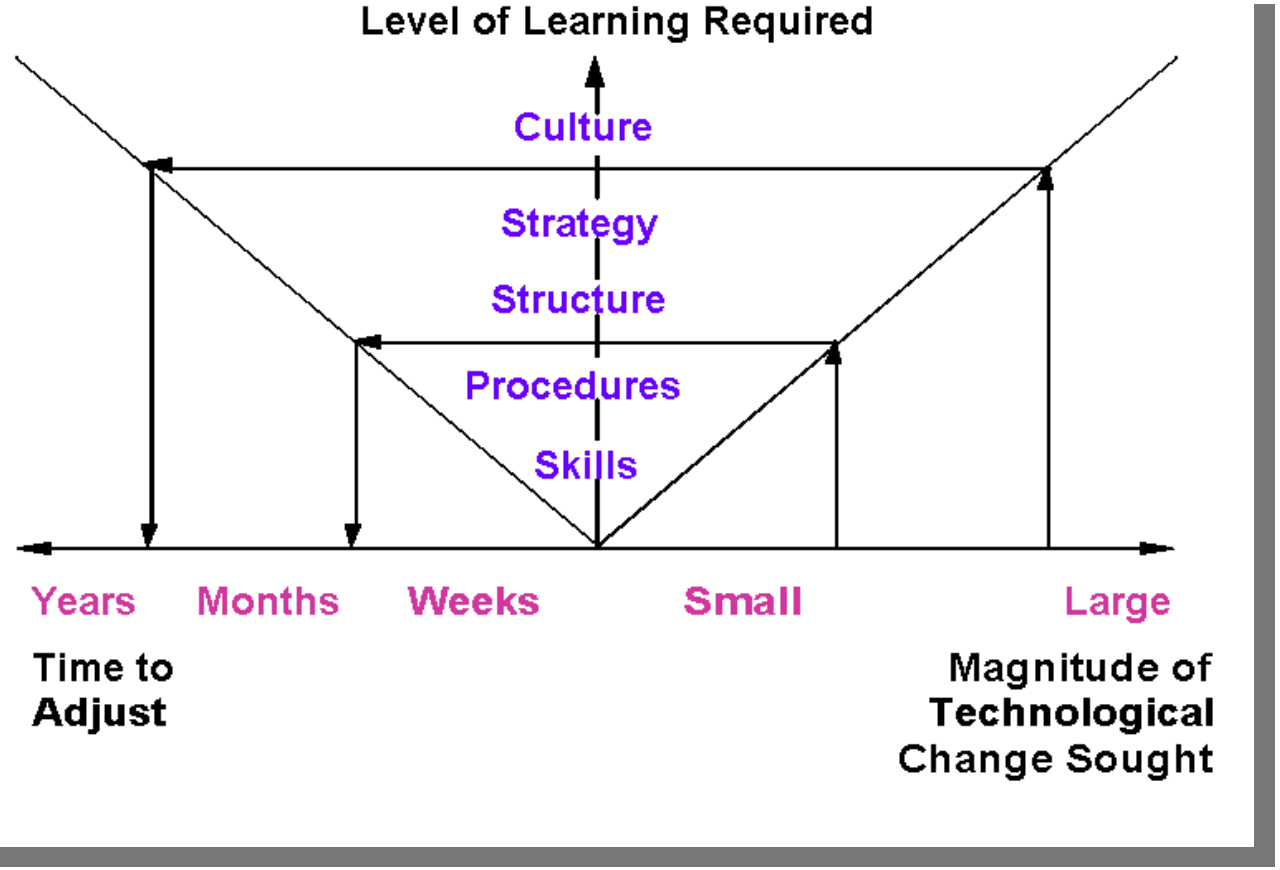
- Section 8.1 is a NON-example of the level of detail we're going for – it's too much and will get pared down in next iteration based on feedback from the team
  - However, the vignette is the type of story it would be nice to have at the beginning of each module
  - The assessment suggestions for 8.1 is generally ok at this point
- Sections 8.2 forward are the more desired level of detail that we would provide to the developer team….

Subtopic: 8.1 General & Agile-Specific Factors in Enabling Cultural Change

- Many models to enable*any* organizational change also apply to Agile adoption
  - Adler magnitude of change model
  - Rogers/Moore Adoption Population model
  - Satir Change Model
  - SEI Adoption Commitment model
  - Ward Cultural Influence Channels model
- There are some factors specific to Agile adoption to consider
  - Trust-based relationships
  - Enabling transparency (usually via information radiator-supportive ALCM tools)
  - Engineering support tools for automated testing/continuous

Suggested Content: Adler Technology Model

- Adler Technology Model is used to answer the “how big is the change?” question (for any technology)
- MT: In most cases, Agile adoption is a CULTURE change for government organizations, so strategy, structure, skills, and procedures will all have to be addressed



Adler, P. and Shenhar, A. “Adapting Your Technological Base: The Organizational Challenge”, Sloan Management Review; Fall 1990; 32, 1

Suggested Content: Evidence that Agile is A Culture Change

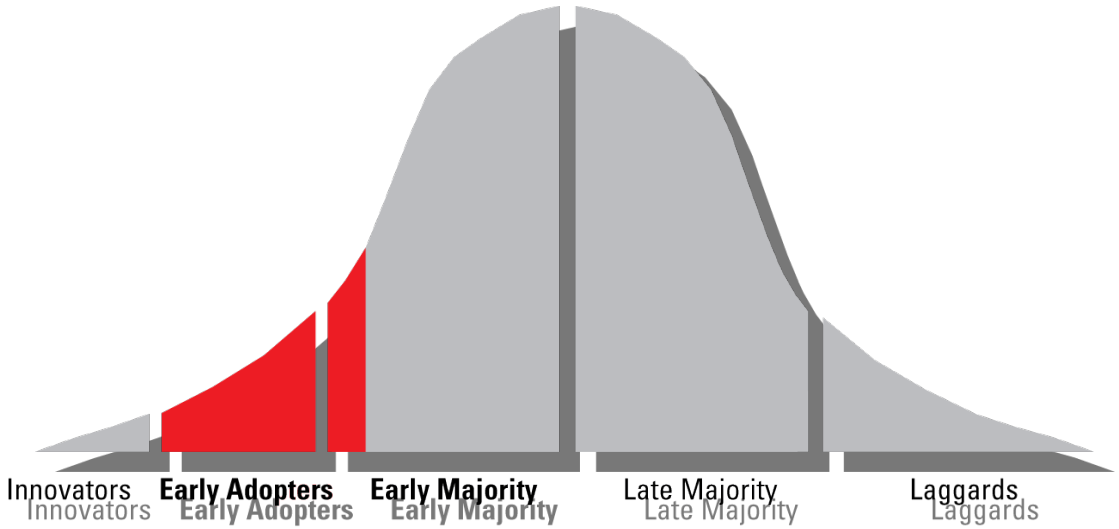
BARRIERS TO FURTHER AGILE ADOPTION
At the agile initiative level, respondents cited organizational culture or a general resistance to change as their biggest barriers to further agile adoption, followed by not having the right skill set.
*Respondents were able to make multiple selections.
44% Ability to change organizational culture
35% Not enough personnel with the necessary agile experience
34% General organizational resistance to change
32% Pre-existing rigid/waterfall framework
29% Management support
24% Management concerns about lack of upfront planning
23% Business/user/ customer availability
22% Concerns about a loss of management control
16% No barriers
15% Confidence in methods for scaling agile
14% Concerns about the ability to scale agile
13% Development team support
12% Perceived time and cost to make the transition
11% Regulatory compliance

VERSIONONE.COM
©2015 VersionOne, Inc. All rights reserved.
State of Agile is a trademark of VersionOne, Inc. and VersionOne is a registered trademark of VersionOne, Inc.

VERSIONONE
Agile Made Easier

Suggested Content: Rogers/Moore Adoption Population Model

- Rogers/Moore adoption population model describes changes in different approaches to accepting new technologies that are relevant to what kinds of communication, training, etc are most useful
- MT: understanding the adoption category, especially of early pilots, helps you determine what support mechanisms are needed to promote a successful outcome



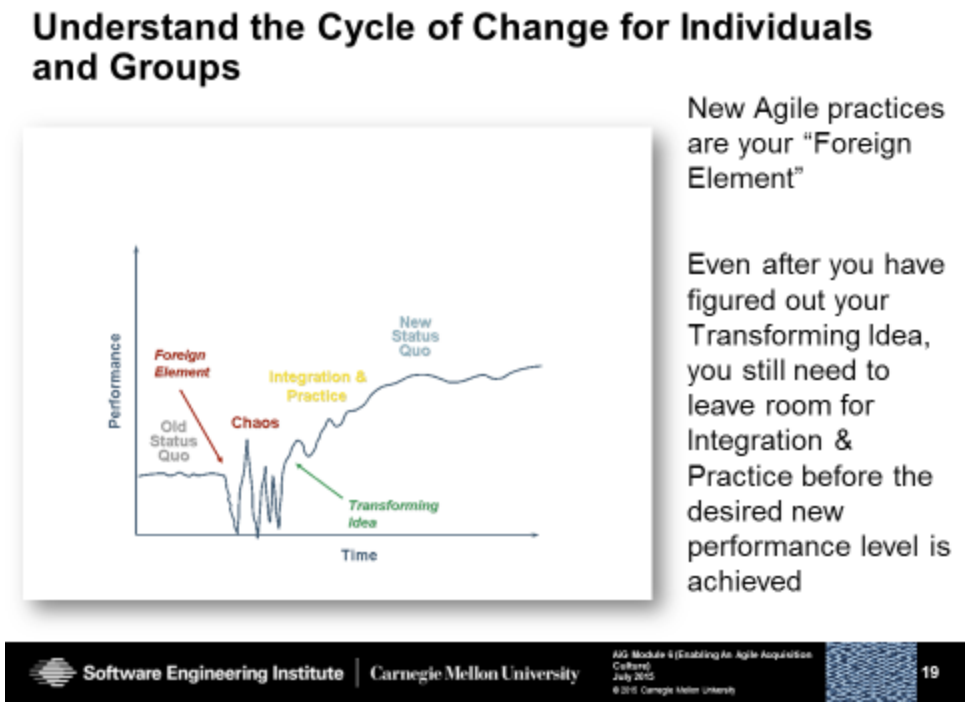
Moore, G. *Crossing the Chasm, 3rd edition.* Harper-Collins, 2014.

Suggested Content: Moore Adoption Population Category Implications

- Not all changes affect an individual the same way
  - Some people who are early adopters for one type of technology are laggards for another
  - Innovators and Early Adopters are good candidate for “technical feasibility” pilots – answering “Will the technology work at all?”
  - Early Majority and Late Majority are better for “adoption feasibility pilots”– answering “What does it take to make the technology work HERE?”

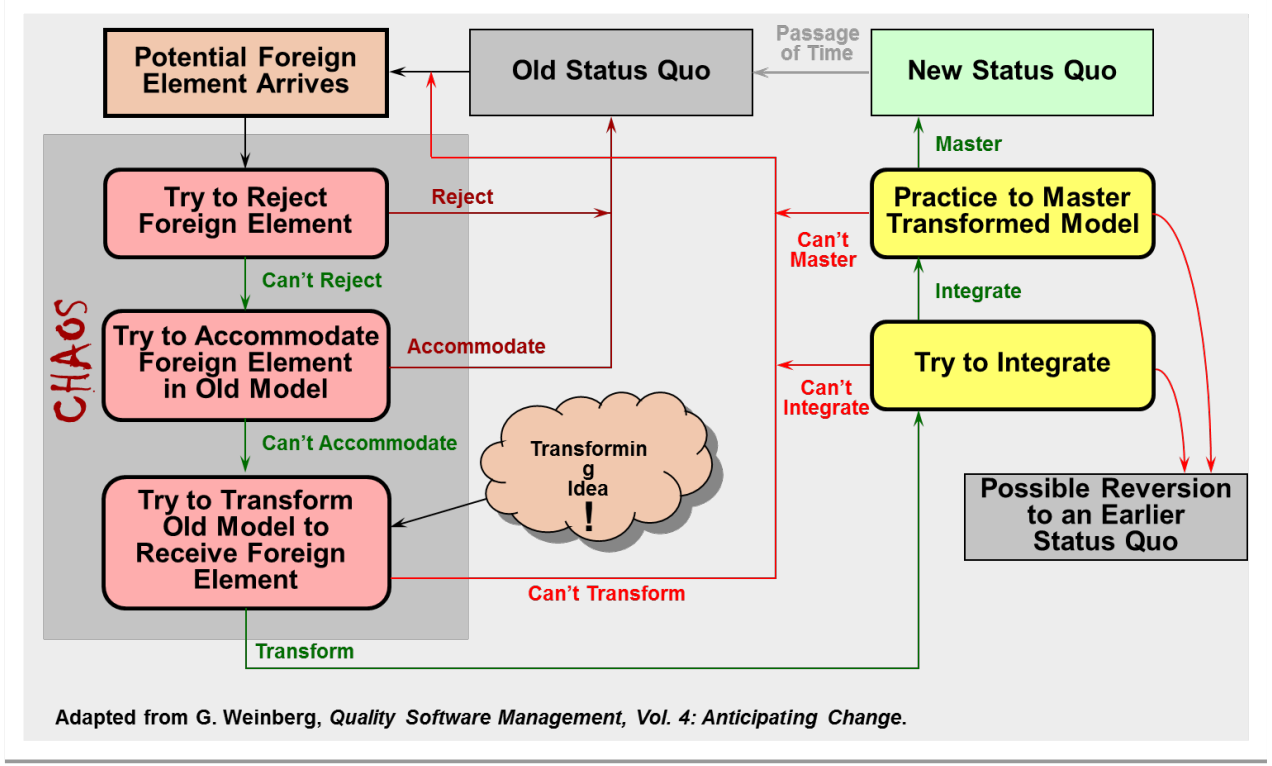
Source: Miller, S. et al. *Agile in Government: Practical Considerations,SEI* course for government settings. Copyright Carnegie Mellon University, 2016.

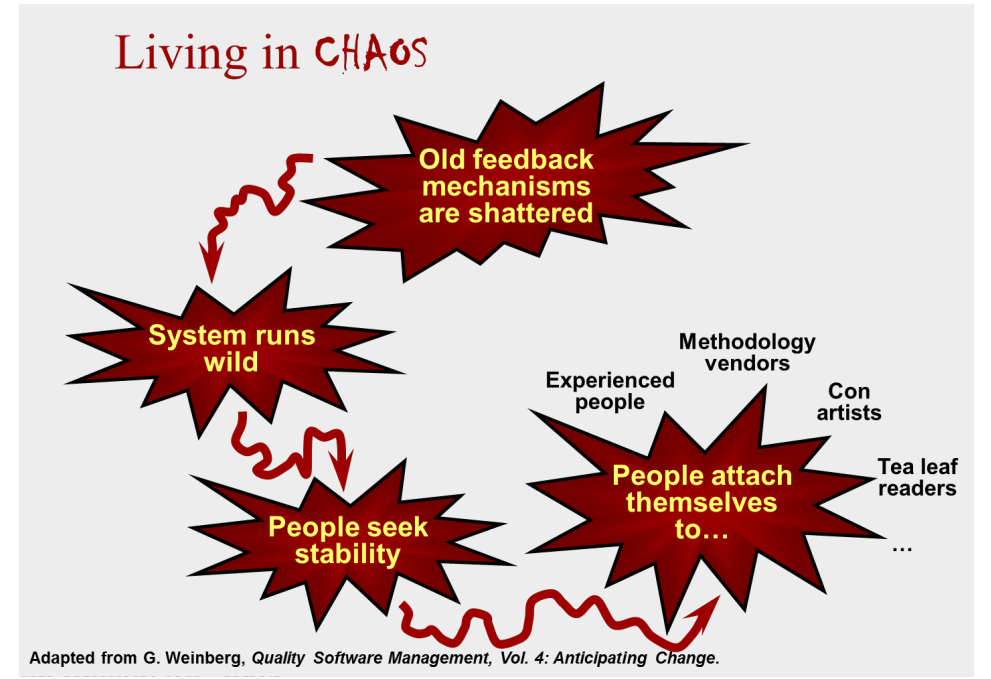
Suggested Content: Satir Change Model


Understand the Cycle of Change for Individuals and Groups
New Agile practices are your "Foreign Element"
Even after you have figured out your Transforming Idea, you still need to leave room for Integration & Practice before the desired new performance level is achieved
Performance
Foreign Element
Old Status Quo
Chaos
Integration & Practice
New Status Quo
Transforming Idea
Time
Software Engineering Institute | Carnegie Mellon University
19

- MT: Individuals, groups, and organizations all go through a predictable cycle of dealing with change, whether the change is perceived positively or negatively
- Understanding where you (and groups you interact with) are in the cycle is a key to helping people through to a New Status Quo

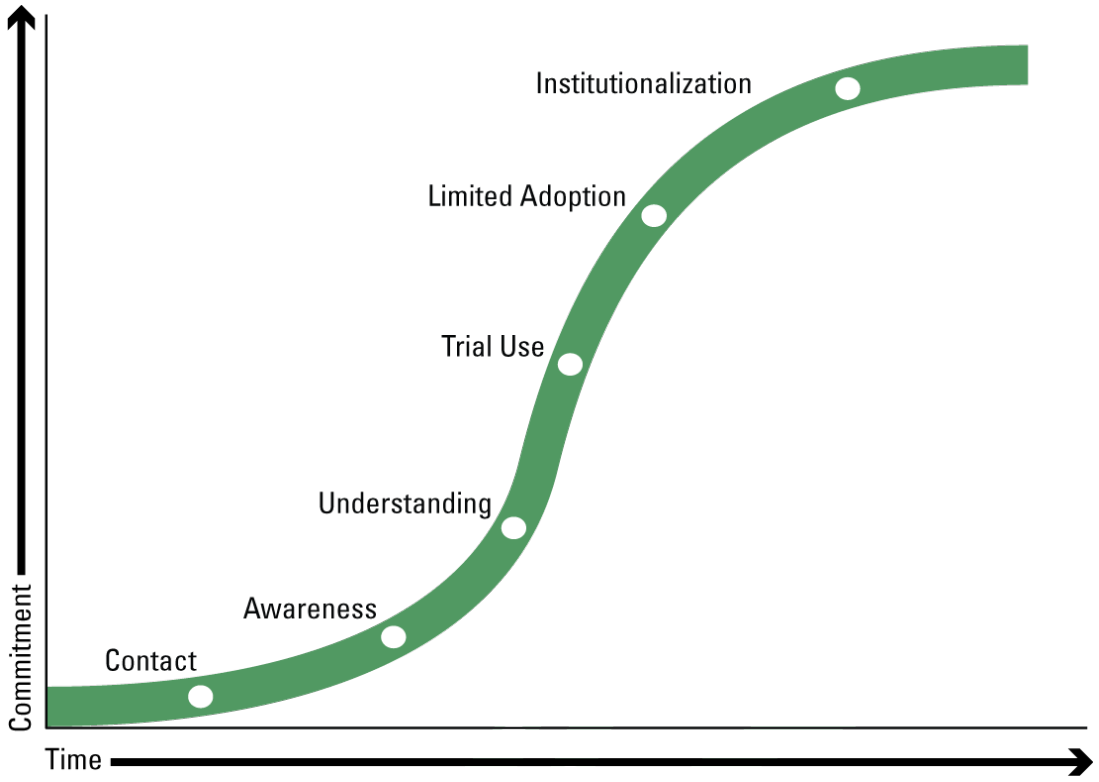
Suggested Content: Moving Through the Satir Change Cycle





Source: Miller, S. & Myers, C. "Process Improvement Tutorial", SEPG 2004. Copyright Carnegie Me

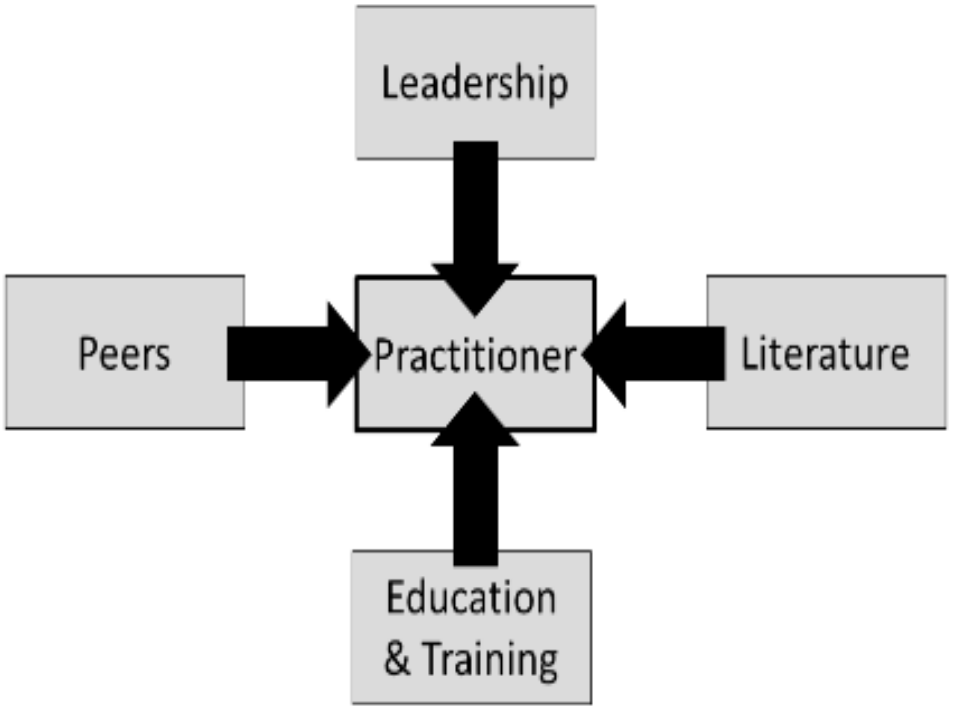
Suggested Content: SEI Adoption Commitment Model



*Adapted from Daryl R. Conner and Robert W. Patterson, "Building Commitment to Organizational Change,"
Training and Development Journal (April 1983): 18-30.

- The SEI Adoption Commitment Model illustrates the level of "energy" needed for individuals and groups to move through an adoption cycle
- MT: Different kinds of support mechanisms are needed at different stages
  - Communication mechanisms (like training, case studies) support Contact, Awareness, & Understanding
  - Implementation mechanisms (like checklists, measures) support Trial Use, Adoption, and eventually, Institutionalization

Suggested Content: Ward Cultural Influence Channels Model



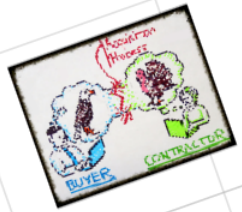
- Complementing the SEI Adoption Commitment model, Ward's Cultural Influence Channels model highlights the roles of Leadership and Peers as sources of influence, as well as classic influences of education, training, and literature
- MT: Agile adoption just at "grass roots" level won't change culture. A "leadership only" change won't work either. Both channels have to be engaged, and using multiple sources for "why we should do this"

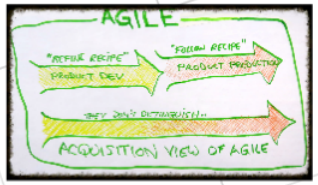
Source: Miller, S. & Ward, D. *Update 2015: Considerations for Use of Agile in Government,* SEI-TN-16-09, Software Engineering Institute, Carnegie Mellon University, January 2016.

Suggested Content: Agile-Specific Factors for Acquisition Contexts

Business & Acquisition Factors

Clear program goals
Defined success strategies
Project funding secured
Close user/developer collaboration enabled
Clear alignment sw goals/program goals
Interim Delivery enabled
Oversight supports agile principles
Appropriate contract type
Appropriate life cycle activities
Agile at scale enabled





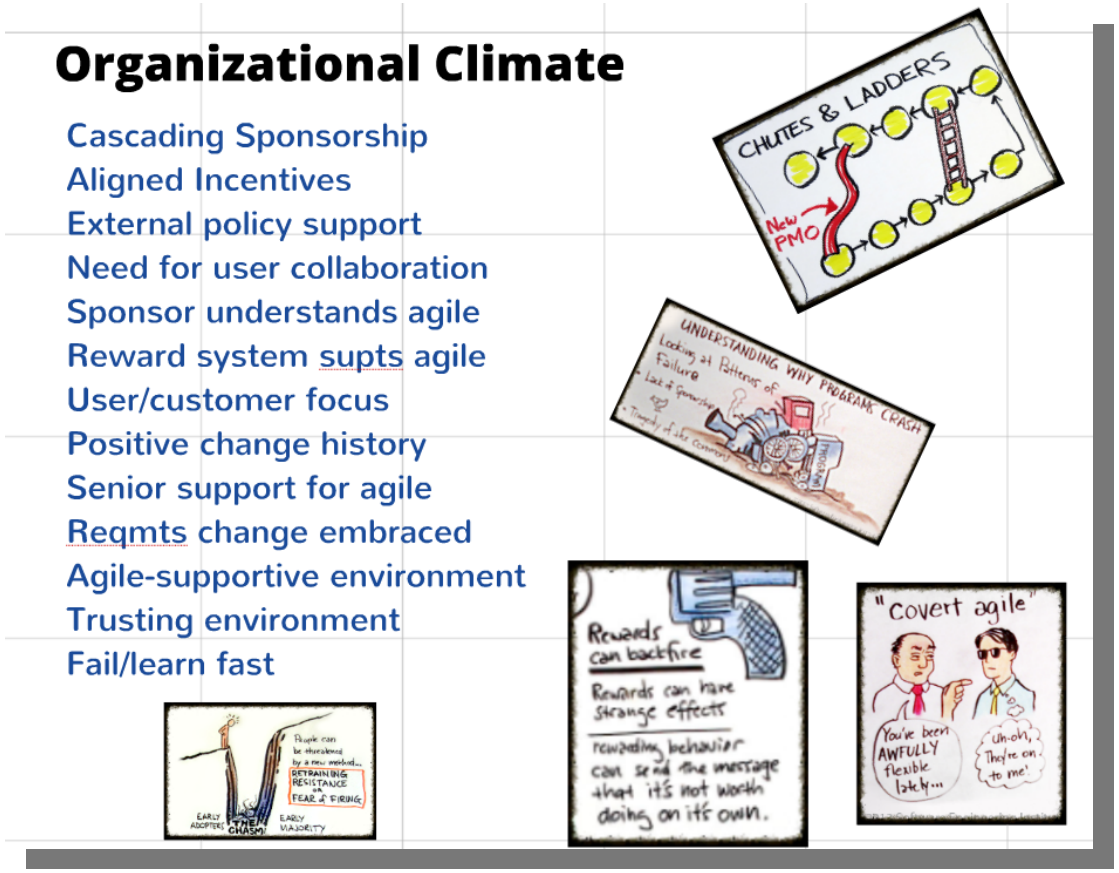
Source: Miller, S. “Is Your Organization Ready for Agile? Part 1”, SEI blog, https://insights.sei.cmu.edu/sei_blog/2012/10/readiness-fit-analysis.html

- MT: There are some specific acquisition factors for Agile (e.g. enabling interim, incremental delivery) that go beyond typical technology adoption factors

Subtopic: 8.2 Organizational Climate

- Leadership/sponsorship
- Communication
- Values
- Reward systems
- Structures
- Skills

Suggested Content: Organizational Climate Enablers for Agile Adoption



- MT: “Alignment” is a key term for Organizational Climate and other categories of adoption enablers –
  - alignment between the implementation and oversight,
  - alignment between the Agile tenets and principles and those of the organization
  - Alignment between the leadership and the managers and practitioners

Suggested Content: Leadership Enablers & Barriers to Agile Adoption

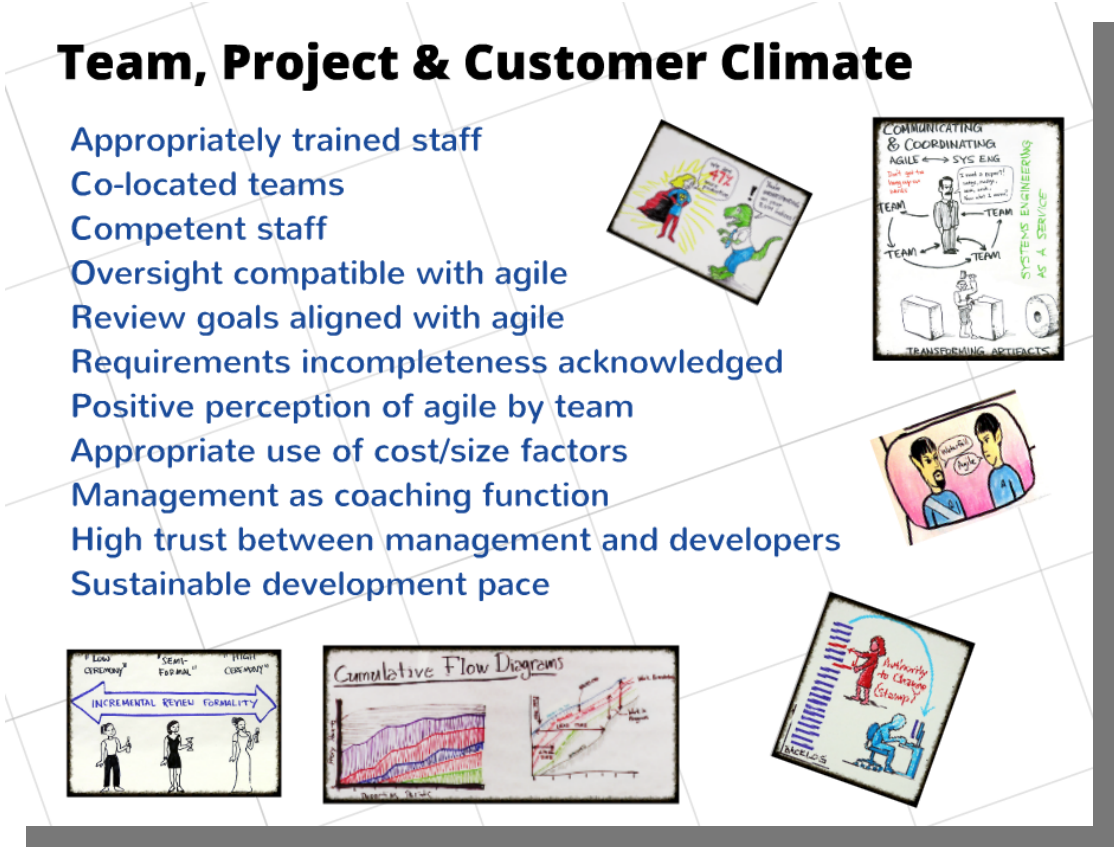
Leadership Style	Agile DoD	Traditional DoD
	• Facilitative leadership • Leader as champion and team advocate	• Leader as keeper of vision • Leader as primary source of authority to act

- Leadership sponsors the change; for the adoption to be successful, leadership must understand how their role changes and what the new questions are to ask to drive new behaviors.
- MT: Without the leadership vision, confusion about the adoption is apparent within the organization.

Subtopic: 8.3 Project, Team & Customer Environment

- Predictable pace
- Communication
- Trust
- Alignment
- Collaboration

Suggested Content: Project, Customer & Team Environment Enablers for Agile Adoption

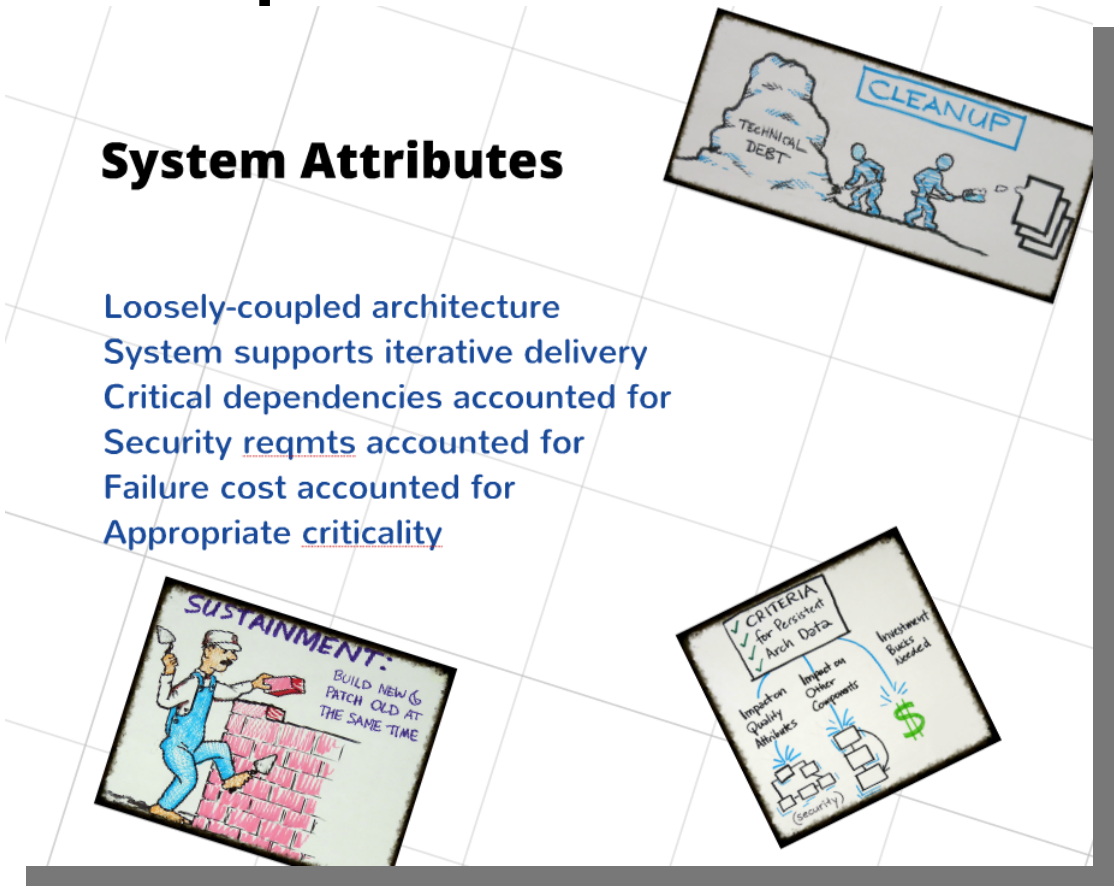


- MT: Although much Agile adoption focuses at the team level, the project and customer climate have significant effect on the program's ability to execute an Agile development successfully, although some of the factors (e.g. appropriately trained staff) are factors in ANY successful program

Subtopic: 8.4 System Environment

- Loosely coupled architecture
- Interactions with systems engineering
- Incremental delivery enabled

Suggested Content: System Environment Enablers for Agile Adoption



- MT: Although most of the Agile adoption enablers are focused on people issues, there are some aspects of the system being developed or evolved that have an effect as well
  - Loosely-coupled architecture is a particularly powerful enabler, if present

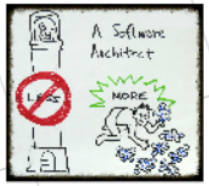
Subtopic: 8.5 Technology & Process Support Environment

- Contracting supports
- Automated testing
- Continuous integration tooling
- Short iterations
- Self-organizing teams
- Practices for supporting decentralized decision making

Suggested Content: Technology and Practice Enablers to Agile Adoption

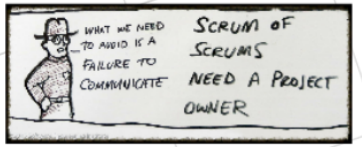
Technology Environment

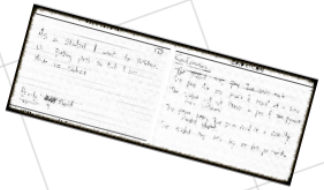
Technology and tools support agile
Project tools support agile
Project technologies accounted for



Agile Practices

Test-driven development
Short (<6 wk) iterations
User stories
Continuous integration
Prioritized Product Backlog
Product Owner
Relative estimation
Management as Barrier Remover
Self-organizing team
Self-managing team
Pair programming
Daily stand up meetings
End-Iteration Demos
End-Iteration Retrospectives





Suggested Content: Technology & Practice Enablers-2

- MT: Although “individuals and interactions over processes and tools” is an Agile Manifesto tenet, it’s also true that the most successful organizations adoption Agile have made appropriate investments in choosing the right Agile practices and supporting tools for their environments
  - In particular, technology and organizational support for automated testing and continuous integration are key technology/process enablers

Subtopic: 8.6 Understanding Your Own Organization's Adoption Risks/Mitigations

- Overview of SEI Readiness & Fit Analysis